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(*Continued from page* 648.)

Some Aspects of the Milk Problem, with Special Reference to the Need for a State Veterinary Health Service.

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The reason I have been honoured with an invitation to provide a subject for discussion on this important occasion will be obscure to most of you. Indeed, a comparison of the status, in public health work, of those who will criticise my humble effort with that occupied by myself, would appear to furnish an example of the absurdity of placing the cart before the horse.

More probably, however, the real cause for a practising veterinary surgeon having been asked to address you is an atmosphere of doubt as to how best, in this field of veterinary work, an apportionment can be made of the duties which may be imposed upon the profession and as to how far the general practitioner can be relied upon to participate.

I want to say at once, therefore, that in urging the claims of the body to which I belong, it should be regarded as a general principle that the foundation of our claim to share these public health duties must depend upon our willingness to work in collaboration with more highly-trained administrative veterinary officers of whom those gentlemen who will open the discussion are distinguished examples.

As I have received no directions as to the ground which I should attempt to cover, or even suggestions for a title of the subject to be discussed, I have taken it for granted that a general survey from the point of view of a part-time veterinary inspector of 30 years' local experience will be all that is expected of me.

My first desire, then, is to express my firm agreement with those who believe that what we understand as the Milk Problem entirely depends for a solution on the possibility of eradicating bovine tuberculosis from our dairy herds.

Whether or not this is capable of accomplishment with due regard to financial and other economic considerations, is another and admittedly difficult question.

But let us first examine our past efforts in this connection. If a military simile were permissible, I should say that none of the enemies of mankind has drawn more verbal gunfire than the tuberculosis bacillus, and that none has emerged with less cause to admit defeat or even serious loss after so long a period of warfare.

What is the reason then that, 46 years after the enemy was first identified and located, he still remains in occupation of a third of the invaded territory ?

The answer is that he remains entrenched because we cannot afford the cost of turning him out—we who spent five millions a day on another war !

No responsible person would suggest that the immediate wholesale destruction of all tuberculous cattle is anything more than a dream which some day may come true, but it is not much more fantastical, as formulating practical safeguards, than most of our other legislative efforts in connection with the milk problem.

Let us see of what these consist.

The statutes dealing with Diseases of Animals and the supervision and control of Dairies, Cowsheds and Milkshops, commenced with the Contagious Diseases (Animals) Acts of 1878 (amended by the Act of 1886), under which Orders known as The Dairies, Cowsheds and Milkshops Orders of 1885, 1886 and 1899 were made by the Privy Council, but the Privy Council's jurisdiction in the matter was subsequently transferred to the Local Government Board (now the Ministry of Health).

The *Milk and Dairies Act*, 1914, provided for the repeal of section 9 of the Act of 1886 (under which the Order was made) but the operation of the 1914 Act was postponed by an Order of the Local Government Board until October 1st, 1925, and was further postponed by the *Milk and Dairies Acts Postponement Act*, 1915, which provided that the Act of 1914 should not come into operation until such date, not being later than the expiration of one year after the termination of the War as the Local Government Board might by Order appoint.

The *Milk and Dairies (Consolidation) Act*, 1915, was placed on the Statute Book in July, 1915, but did not become immediately operative as, by Section 21 (1) it was provided that the Act should come into operation on such date as the Ministry of Health might by order appoint.

The *Milk and Dairies (Amendment) Act* (1922) again postponed the action of the Consolidation Act of 1915 until September 1st, 1925. Under this last Act the following Orders have been made by the Ministry of Health—*Milk (Special Designations) Order*, 1922, which prescribed the terms and conditions subject to which licences may be granted for the sale of various grades of Milk, viz., "Certified," Grade A (Tuberculin Tested), Grade A, and Pasteurised Milk.

This Order of 1922 was revoked as from July, 1923, by the Milk (Special Designations) Order, 1923, the main provisions being re-enacted with a relaxation of certain conditions under which licences may be granted for the sale of "Grade A" and Pasteurised Milk.

The *Milk and Dairies Order*, 1926, revokes the Dairies, Cowsheds and Milkshops Orders of 1885, 1886 and 1899, so far as they relate to England and Wales, and all regulations made thereunder by Local Authorities.

Now, although all this reads more like the report of a discussion in Parliament than matter suitable for inclusion here, I have felt compelled to go somewhat fully into it, if only for the information of any of our distinguished

foreign visitors who may be present. To them it may seem more like a series of revocations and postponements than a serious attempt to master a difficult subject.

What will surprise them even more, however, is to learn that, in each and every enactment, to safeguard public milk, which has ever become operative in this country, the mere existence of a Veterinary Profession was not even referred to until the Milk and Dairies Act of 1914, Section 7 of which made provision whereby a "Local Authority" *might* and when required by the Local Government Board *should* appoint one or more Veterinary Inspectors for the purposes of the Act.

The fact is that, up to the present, all our milk laws have been tentative and vacillating, and even that which is at present operative (The Consolidation Act of 1915) also the Milk and Dairies Order, 1926, made under it, bear the imprint of mere expediency. In short, we seem willing to wound but afraid to strike at the fundamental reasons for the existence of a Milk Problem, which however will remain unsolved just so long as this attitude continues.

As an example, the following extracts are taken from a Ministry of Health Circular (757) of January 20th, 1927, with reference to the Milk and Dairies Order, 1926, addressed to County Councils, &c., in explanation of the administration of the Order.

Section 18 of this Circular reads as follows:—

"The Minister's view is that the minimum which could be regarded as satisfying the requirements of Article 8 of the Order would be such inspections as are necessary for purposes of sections 3 and 4 of the Act, and for investigating cases where some definite cause of suspicion exists such as the discovery of tubercle bacilli in a sample of milk."

Now, Article 8 of the Order prescribes that:—

"Every County Council and County Borough Council shall cause to be made such inspections of Cattle as may be necessary and proper for the purposes of the Act and of this Order."

Sections 3 and 4 of the Act deal with the power to stop a supply of milk likely to cause tuberculosis and an obligation to inspect dairies in certain cases.

"If the Medical Officer of Health of a County or County Borough is of opinion that tuberculosis is caused or is likely to be caused by the consumption of milk supplied from any Dairy . . ."; he may take action to stop such supplies, etc. (Section 3), or again:—

"If the Medical Officer of Health of any local Authority has reason to suspect that tuberculosis is caused by the consumption of any milk which is sold within his area he shall endeavour to ascertain the sources of supply and shall then give notice to the Medical Officer of Health of the County in which the cows from which the milk is obtained are kept, etc." (Section 9).

All this rather suggests that the door is being locked after the contents have been stolen.

Again, section 19 of the same Circular (757) contains the following paragraph:—

"Inspection conducted on purely routine lines may not, in all cases, be the best means of attaining the objects of the Act."

Whatever the precise objects of the Act may be, I cannot see that anything short of routine inspections are likely to fix the guilt before damage is done, or that any other method can assess the potential risk unless milk is sampled from every cow as regularly as each individual animal would come under the ban of routine inspection.

The effect of all this is well illustrated in, at least,one case within my knowledge where a large County has refused to institute any system of inspection whatever except the occasional efforts which they may be compelled to take in order to fix the guilt in any case of suspected danger to which their attention may be drawn.

The final result is that the whole business lacks any sort of uniformity or co-ordination. In some districts uniform systems of veterinary inspection are in force, whilst in others anything of the kind is either unknown or carried out at such long intervals as to be almost valueless.

And for what reason was the administration of Part IV of the Milk and Dairies Order divorced from the remainder, or why separate the veterinary and sanitary inspectorship duties as two distinct items?

In my own case I carry out the joint duty in a portion of the area, but in part of it I have no jurisdiction with regard to sanitation, which is a matter entirely for the sanitary inspector. During all these long years of controversy and the making and remaking of new laws and regulations the counsel of the veterinary profession has never been sought, or, apparently deemed worthy of consideration.

But are we not ourselves, to some extent, responsible for our position in the rear rank? Knowing it to be so, have we not failed to proclaim that the architectural designs of the edifice are bad and that no building capable of satisfying public requirements can be erected in accordance with any such plans as those hitherto submitted?

On searching the professional journals for reports of discussions on this question of "Milk," one finds that they can be counted by the score but, with a few notable exceptions, everybody seems to discuss the question without much regard to any inadequacy in the governing regulations.

Some of you may consider that, up to this point at any rate, I have treated the subject with insufficient regard to its purely veterinary aspect. My reply is that, in this connection also, I think the profession often renders itself a disservice.

The very magnitude of the subject renders it incapable of useful discussion in water-tight compartments; neither, I submit, is it possible to make veterinary suggestions in regard to it without pointing the way to their practical adaptability and economic effect.

I said, a little earlier, that there are a few notable exceptions to the way in which the subject is usually handled by the veterinary essayist. I will quote, from only one of these, an extract from an address given by our distinguished President, Lt.-Col. Brittlebank, at Bristol in January, 1927.

Speaking of tuberculous infection in regard to milk, Lt.-Col. Brittlebank said:—

"You will think I am talking of tuberculosis because I have had so much to do with it, but believe me—if you will let me interpolate the remark here—to my mind the key of admission to the whole of the work in this field is

via tuberculosis and when you have dealt with tuberculosis you have gone a long way in dealing with most of the other diseases which are preventible."

Of course, when you have dealt with tuberculosis, you have settled the whole business.

And how are we dealing with it ? By the Tuberculosis Order of 1925, concerning which I will again quote an extract from Lt.-Col. Brittlebank's remarks, made on the same occasion :—

"I feel that so long as merely the provisions of the Tuberculosis Order are carried out and that means, roughly, the finding of advanced cases of tuberculosis, very little good is going to be done. I say advisedly that very little good is going to be done because most of the animals which have been drawn from the milk supply, suffering from tuberculosis, have perhaps done as much harm as they were likely to do."

And again later :—

". . . But I am convinced that unless the veterinary profession is prepared to say that this Order is not likely to lead to any—I want to be careful what I say—to any permanent reduction in the incidence of bovine tuberculosis in this country, there will come a time when it will be found that local authorities are spending a great deal of money in trying to deal with tuberculosis with very little result for the money that they have spent."

Perhaps I have said enough to emphasise my conviction that, in seeking a solution of this difficult problem of "pure" milk, it is under the standard of those who advocate the eradication of bovine tuberculosis that we all should fight.

Any such measures must of necessity be of gradual application, but they need be none the less thorough on that account.

If, however, we are to "throw up the sponge" in regard to the scourge, would it not be better to cease worrying about it ?—Because the result is merely to cause a scare amongst consumers without hope of anything better than empirical remedies.

An example of the latter is furnished by the provisions of the Milk Special Designations' Order by which, presumably, a larger *per capita* consumption of milk is to be encouraged.

Personally, I fail to see in what way the public mind is to be favourably impressed by the advertised announcement, which to those who analyse it means, that the Grade A variety may excusably contain, in a cupful, a larger number of bacteria than the whole of the population of the United Kingdom.

Now let me take the opposite view, viz., that present legislation is sufficient to safeguard the purity of supplies, an opinion apparently held by no less an authority than the Chief Medical Officer of the Ministry of Health, from whose annual report, for the year 1925, I quote the following (paragraph 324, page 161).

"For many years past most of the large towns have been endeavouring to protect their inhabitants against the dangers of tuberculous milk by the examination of samples of milk arriving in their districts and by tracing those found to be infected to the farm from which the milk was derived. These farms were often situated in remote country districts, and under powers provided by local Acts, veterinary inspectors appointed by the towns in question visited the suspected farm with the object of identifying the cow responsible for the tuberculous sample.

"As in many instances a period of four or more weeks had elapsed before a report upon a sample examined by means of inoculation into guinea pigs, could be made, the diseased cow had often disappeared from the farm before the arrival of the veterinary surgeon. Even where a diseased cow was found on the suspected farm nothing more could be done than to prohibit the sale of milk from that farm in the town in question until the diseased animal had been removed from the herd. This latter condition was generally, however, quickly complied with, the diseased animal in many cases being sold to some other farm where she resumed her function of producing tuberculous milk for some other district. Whatever protection therefore the special milk clauses in local Acts may have afforded to those towns which possessed them, it was largely obtained at the expense of other districts for which no special powers of the kind were available.

"The Milk legislation of recent years has aimed at disposing effectually of this serious defect and we have now in the Milk and Dairies (Consolidation) Act, *an arrangement which provides for the protection equally of every district in the country against the danger of tuberculous milk, and in the Tuberculosis Order an instrument whereby an animal found to be giving tuberculous milk can at once be disposed of by slaughter.*" (The italics are mine.)

Naturally, a statement from so eminent a source that an arrangement has now been provided "for the protection equally of every district in the country against the danger of tuberculous milk," must alike command respect and some diffidence in questioning its accuracy. Nevertheless, I submit, with all respect, that the conclusions arrived at are true only to an almost insignificant degree and are not based on a true hypothesis of the facts as they exist.

In the first place, although the Act provides for, it does not compel, the adoption of safeguards until the need for action has been demonstrated by the detection of offending samples. Thousands of dairy cows therefore escape any sort of inspection at all, although, by general consent, at least 30 per cent. are themselves tuberculous to a problematical extent.

I submit also that the statement is wrong in claiming, what in effect is claimed, that a tuberculous lesion of the udder is not of importance as harmfully affecting the milk unless or until it is sufficiently pronounced to be discoverable on manipulation.

In my judgment it is again wrong in its implication that clinical cases of tuberculosis (capable of being dealt with under the Tuberculosis Order) must necessarily or even frequently be brought to official notice, as an example of which I can quote a large part of one county (a whole petty sessional division) in which not a single case of the disease has been reported in two years.

The only way in which even these open cases of danger can be unearthed is by routine veterinary inspection which,

under present conditions, can be evaded at the will of the local authority.

After all, what is the immediate financial as distinguished from the moral inducement for an owner to report these cases voluntarily? It is true, of course, that the destruction of an ultra-infective case is, in itself, a gain to the owner inasmuch as danger to the rest of the herd has been thereby removed. It is difficult, however, to explain to the farmer, why, in order to "benefit" by the Order he must keep the animal until it is sufficiently diseased to come within its purview and has done all the damage possible in arriving at that stage.

Another reason why, in the absence of systematic veterinary inspection, suspected disease of the udder is not hastily reported is that the milk of an animal may be, and often is, held up for from four to six weeks whilst a biological test is in progress and without any compensation for the loss of milk when the result eventually proves negative.

Certainly, the examination of samples taken as and when the milk arrives from individual farms must be productive of valuable confirmatory information, but we are working at the wrong end in regarding this as a common sense first-line of attack, and, in any case, there are many authorities who do not take ten samples in as many years.

In view of all this it seems to me to be wrong to express satisfaction with the present regulations as being sufficient "for the protection equally of every district in the country against the danger of tuberculous milk," and I shall be interested to hear the views of any members of this audience who subscribe to that opinion.

The real facts are, as they appear to me, that the public never will be so protected until a more widespread sympathetic interest is taken in the producer's side of the case, and some effort made to share the cost of eradicating the chief cause of all the trouble which, being of national importance, should be shared by all.

It must not be forgotten that the production of market milk is not a highly lucrative business and that its average value renders it almost immaterial to many producers whether market milk is sold as such or devoted to other purposes. This consideration should not be lost sight of in framing schemes for maintaining high standards of purity without due regard to the *quid pro quo*.

I will now attempt to deal with the subject more particularly from some of its more clearly defined veterinary aspects.

As was mentioned earlier, present legislation provides for the employment of veterinary inspectors for such duties as, in the opinion of the employing authority, may be deemed sufficient, with the result that, too often, the first consideration is, not how best the duties can be performed, but at how small a cost. In one large county, for instance, a serious proposal was made, and defeated only after protracted discussion and delay, that one full-time veterinary inspector should be appointed to carry out the whole of the duties throughout a county of over 600,000 acres, seventy miles in length, with a population of over 200,000, and containing about 25,000 head of dairy stock!

The adjoining county has gone one better by declining to make any appointment or institute any system of veterinary inspection whatever. Other counties have devised methods of routine inspection by whole-time officers and others, gain, have appointed local practitioners with or without a full-time administrative veterinary officer, the whole business, as usual, lacking uniformity, imagination and thoroughness.

Now let us consider what value can legitimately be placed on veterinary inspection, first, under the powers at present in operation and, secondly, under those which we may agree upon as being essential to the attainment of the objects in view.

The diseases other than tuberculosis specially mentioned in the Act or Order as coming within the purview of the veterinary inspector, are as follows:—

Acute mastitis, actinomycosis of the udder, anthrax, foot-and-mouth disease, suppuration of the udder, and any other disease affecting cows which, by a Milk and Dairies Order, is declared to be a disease for the purposes of Section 5 of the Act. The remaining diseases specified in the Order are, any comatose condition, any septic condition of the uterus, and any affection of the udder or teats which is likely to convey disease. From this list it will probably be considered sufficient for all practical purposes if we confine our attention, on this occasion, to those affections which are more intimately associated with the udder, and which are of special importance either in regard to diagnosis or their possible effect on the hygienic qualities of the secretion.

With regard to acute mastitis, no difficulties to the trained observer are likely to arise. Actinomycosis of the udder is, in my experience, an uncommon affection and not likely to be met with except on rare occasions. With reference to suppuration of the udder, however, the case is different, as one meets with quite a large number of cows in which one or more atrophied quarters retain pus-forming centres for indefinite periods. It would be interesting to decide, therefore, whether the wording "suppuration of the udder" as affecting one or more derelict quarters, is meant to be taken literally. If so, quite a large number of otherwise healthy dairy cows are thereby placed out of commission. I imagine the veterinary inspector would be allowed to exercise commonsense in the matter, but there is always a risk that some obscure ailment might be regarded as traceable to cases of this kind in which event the precise wording of the Act could be quoted against any defence he felt justified in putting forward.

The same applies to "any affection of the udder or teats which is likely to convey disease." Here, again, rather a large field is opened up by reason of the fact that eruptive affections of the teats are decidedly common and often affect a large proportion of a herd for quite long periods, the healing process being retarded by the act of milking.

Who is to decide whether or not these affections of the udder are "likely to convey disease"? If the decision is to rest with the veterinary inspector his position is not enviable because, either he holds up the milk from all affected cows for an indefinite period, which throws any milk contract completely out of gear, or he risks the discovery of bacteria "likely to convey disease" at the distributor's end. It would seem that the responsibility of passing or condemning the sale of milk from these cases

should be placed on the shoulders of the Medical Officer of Health on receipt of a veterinary report as to the nature and extent of the affection.

We will now briefly discuss the key to the controversy, the tuberculous udder, before saying something more about the tuberculous cow as a factor in conveying disease.

And first, what is to be said of the contention, for that in effect is what it is, that the possibility of an udder being tuberculous need cause no concern unless the lesion is sufficiently pronounced to be discoverable on manipulation? Do we really believe that, or have we adopted the theory from mere expediency and as a result of restrictions on other methods of diagnosis of which we should prefer to avail ourselves? And, again, do we really believe, what in effect we also claim, that for all practical purposes the palpably tuberculous udder is the only important route by which the disease is conveyed through milk, or have we adopted this theory also for the same reasons of expediency and desire to erect the best possible structure from totally inadequate designs?

That tuberculosis, even of the udder, does not always show itself in an orthodox manner is illustrated by the following case with which I have met whilst these notes are being written. My opinion was asked with regard to an indurated enlargement at the upper part of the right hind-quarter of a young Jersey cow. On examination I decided that this was a greatly enlarged supramammary gland, painless, hard, and protruding sufficiently to be noticeable at a distance.

The opposite gland required careful manipulation to detect enlargement and induration, any abnormality being by no means palpable. The udder itself was, all over, of silken consistency and not a "bean" could be detected in it. On testing the animal a violent reaction was obtained, followed, in a few hours, by an interesting *post-mortem*. Both supramammary glands were as large a half a cocoanut, and one mass of old caseating tuberculous material weighing, I imagine, 8 or 10 ounces in the case of each gland. The amazing thing about the case, however, was that after a prolonged search not a speck of the disease could be found in any other organ or gland in the body. This induced me to send the specimen for bacteriological confirmation to the Research Laboratory at Camden Town, which I duly received, together with a note from Professor Tom Hare, in answer to my enquiry, informing me that although he had met with similar cases he was unable to offer any explanation as to the route by which infection had reached the glands.

Here, then, is a case in which both bacteriological and biological milk tests would pretty certainly have failed to indicate an extensive tuberculous lesion in connection with the udder. I agree that an exactly similar case would probably be rare, and I am quoting it chiefly because it has come under my notice whilst these notes are being written. Nevertheless, it seems to illustrate my argument that we are wrong in claiming reliability, much less infallibility, from the examination of suspected milk samples by any of the processes usually employed, including animal inoculation tests. All that is proved in the case of a negative result is that there are no bacilli in the sample, not that there are no tuberculous lesions in the udder.

There are friends of mine here who, I feel, are longing to tell me what a mare's nest I have discovered in this connection. I know their views quite well, and envy them the peace of mind which their methods enable them to enjoy in the full conviction that they are sufficient for every requirement in this matter of diagnosis. Personally, I am not ashamed to admit that on many occasions when I leave a cowshed after inspecting the inmates and their surroundings, I entertain a grave feeling of doubt as to whether I have justified my existence.

...In this connection, if it were permissible for me to try to paint a little pen picture, this is what I would say!

On not very rare occasions I handle an udder which causes me to wish it could plead guilty or not guilty without more ado. I think the udder is rather uneven, one quarter being slightly larger, a trifle more dense, and hanging slightly below the opposite side, it is painless on pressure, but I think the density is rather more noticeable than that of its neighbour, especially towards the upper part, and the secretion is not affected in quantity or appearance. As my somewhat protracted examination appears to the attendant to be a mere waste of time he attempts to reassure me by expressing a definite opinion, which one cannot fail to envy, and which amounts to a verdict of "not guilty" inasmuch as the milk from this quarter "has always been perfect"—a most encouraging piece of presumptive evidence of an opposite kind to that intended.

Finally, I decide that suspicion is not sufficient to justify a hold up for four or five weeks, so that I content myself with a microscopical examination, which proves negative. At my next visit I find the same or some increased clinical evidence and an animal inoculation test is undertaken. Whether the result is negative or positive does not affect the point I wish to make, because in the former event the suspected cow's milk has been virtually lost over a period of—say—two months, and, as I think needlessly so, and in case of a positive decision the case has been hanging about for several weeks whilst it might have been disposed of in as many days.

The majority of those present will be shocked to hear me express the opinion that tuberculin should be used in all doubtful cases of tuberculous mastitis, *i.e.*, those in which the examination of milk smears fails to confirm clinical suspicion, but such is my belief for the following main reasons, a cow in average condition being taken for illustration:—

(*a*) A negative reaction removes all doubt within 24 hours.

(*b*) A positive reaction means the destruction of a tuberculous cow, affected in most cases, with a tuberculous udder, and usually before avoidable damage has been done.

And now a few words as to tuberculous infection of milk *via* routes other than the tuberculous udder, and, incidentally a reason for combined veterinary and sanitary inspection.

In my judgment the liability to such infection has a direct relationship to the possibility of fæcal contamination, not only from diseased animals, but from those in immediate contact with them and that the risk varies with the sanitary conditions which prevail. I am unable to produce any direct evidence in support of this opinion in the case of

veterinary subjects, but the investigations of Dr. R. W. Philip, and Dr. Agnes Porter, of the Royal Victoria Hospital for Consumption, Edinburgh, carried out in 1910, in regard to tubercle bacilli in the fæces of human patients, are interesting. The following is an extract from the report of their investigations :—

"Of the 100 tuberculosis cases examined, 79 were found to yield tubercle bacilli and only 21 were negative... Of the tuberculous patients all those with bacilli in their expectoration, with one exception, presented tuberculosis bacilli in the fæces. Of the 24 cases without sputum, 17 gave tuberculosis bacilli in the stools. These results are striking and are suggestive in regard to clinical diagnosis and the larger aspect of preventive medicine. Thus it may be stated with absolute certainty that the occurrence of tuberculosis bacilli in the fæces is independent of the presence of an intestinal lesion. Indeed their presence has little reference to abdominal tuberculosis. They were actually absent from the only case of tuberculous peritonitis which was examined."

If similar conclusions are applicable to bovines we should do well to consider their significance.

My criticisms hitherto having been largely of a destructive kind, I shall now attempt some suggestions of an opposite character, but first let us see how far we can agree upon what I regard as a few general principles.

(1) The present low *per capita* consumption of milk is a national misfortune for which want of confidence in its purity is largely responsible.

(2) This want of confidence is fostered by the advertised notoriety of bad milk with no corresponding publicity on behalf of good milk.

(3) The first consideration in formulating schemes of improvement must have regard to those economic factors which are of vital importance both to the producer and consumer.

(4) The producer is not responsible for the incidence of tuberculosis amongst his dairy stock and cannot be expected to bear, unaided, the cost of the eradication for the public good.

(5) Tuberculosis is capable of eradication by methods similar to those which have been successfully employed in the case of glanders, the process being extended over a longer period to avoid undue interference with supplies.

(6) The Milk (Special Designations) Order having had the effect, after seven years, of providing annually (at the present rate of consumption) only four days supply for the whole of the country, suggests that the Order might be repealed and replaced by a Measure containing greater inducements for the production of tuberculin tested milk available for all sections of the community and not merely for those who can best afford to pay for it.

(7) The machinery for eradication should consist of a central authority, or State Veterinary Health Service attached to the Ministry of Health and staffed by whole-time veterinary experts. Each county, or other convenient administrative area, should be provided with a whole-time veterinary officer (or officers) but the actual "field" work should be performed by part-time local veterinary inspectors under the supervision and control of their respective county chiefs.

We will now discuss these general principles in somewhat greater detail.

(1) In estimating the financial difficulties in connection with any system of eradication we are apt to ignore the other side of the balance sheet, viz., the effect on the national physique for which the small individual consumption of milk may be responsible.

(2) Exhortations to "drink more milk" will not be effective so long as any substantial doubt is allowed to remain as to whether the adoption of this advice is likely to be in conformity with the consumer's hygienic interests.

As an illustration of this I could quote a county Medical Officer of Health, who recently declared, in public, that no milk was allowed to be used in his household unless or until it had been boiled. Possibly a wise precaution, but not calculated to increase consumption !

(3) The fact that we are dealing with an article, the production of which is not highly remunerative, and which without difficulty can be put to other economic uses, has an important effect in dictating the lines on which schemes for improvement can proceed.

(4) Is not the producer's attitude a reasonable one when he reminds us that all herds of dairy cows are tuberculous to some extent through no fault of their owners, and that if this constitutes a danger to the public health the public must share in the cost of its removal ?

(5) That the disease is capable of eradication I suppose we shall all agree ; as to the means by which this might be undertaken, any agreement will be less marked. In comparing the campaign with that against glanders we must reflect that, in killing a glandered horse there were no food difficulties to take into consideration. In killing a dairy cow, however, we are cutting off an essential diet item sufficient for the requirements of 20 or 30 people. Precisely the same methods therefore are not applicable.

(6) With regard to the milk grading scheme, the following table from the annual report of the Chief Medical Officer of the Ministry of Health for the year 1926 shows the number of licences in respect of each grade at various dates since the inception of the scheme :—

Producers' Licences.	1920	1921	1922	1923	1924	1925	1926
Certified ...	9	23	41	55	71	94	120
Grade A. T.T.	11	15	22	46	61	98	132
Grade A. ...	—	—	—	43	92	176	233
Total ...	20	38	63	144	224	368	485

The report adds :—

"Approximately 9,100 dairy cows were included in licensed herds during the year, an increase of 1,800 over 1925. Of this number, 4,250 were in 'certified' herds and 4,850 in Grade A (tuberculin tested) herds. It is not possible to obtain figures to show the actual amounts of each type of milk disposed of, but assuming the actual production per cow to have been 550 gallons, these milks were being produced at the approximate annual rate of 2,300,000 gallons of 'Certified' and 2,700,000 gallons of Grade A (tuberculin tested) milk."

The practical value and educational effect of the T.T. milk grading scheme, after seven years operation, would therefore seem to be capable of assessment at four days' supply of the annual requirements of the country. Its chief weakness is, of course, in regard to the difficulty of finding markets for the higher-priced article, and in regard also to the importance of protecting the public against itself in its freedom of choice of a lower-priced product. Also, objection might be urged against it on the ground that the safeguards are in favour of those best able to look after themselves, and to pay the higher cost.

(7) It will be interesting to see how far we are in agreement as to the necessity or, as I prefer to call it, the indispensability of a State veterinary health service in the solution of this intricate problem.

Surely its veterinary aspect is sufficiently important to warrant such a service which, if properly constituted, would formulate regulations with due regard to their practical usefulness, economic effects and lasting results. This, I contend, cannot be said of any efforts hitherto made. Armed with powers similar in scope to those which have been successful in the eradication of glanders, the elimination of tuberculosis from milk could proceed concurrently with the work of eradication.

Space will not permit of anything more than a brief reference to measures adopted to this end in other countries, and notably in the United States of America, where between 1917 and 1926, 29,000,000 cattle were tested with tuberculin, and 1,008,096 reactors condemned and slaughtered. (*Tuberculosis Eradication from the National Standpoint* by Dr. J. A. Kiernan.)

I have quoted this merely as illustrating what can be done when the veterinarian is summoned to take the offensive, and is given more or less a free hand to use those weapons which science has placed in his hands, but the use of which, in this country of ours, is rather discouraged than otherwise.

I am not suggesting that precisely similar methods would be suitable for adoption here; all I wish to illustrate is the scope and character of the campaign for extermination when conceived and conducted by veterinarians as compared with the feeble efforts hitherto conducted in this country.

At the commencement I expressed the hope that in any campaign such as I have attempted to outline, local veterinary practitioners would generally be appointed to undertake the actual " field " work under the supervision and control of a whole-time administrative veterinary officer in each county or other convenient area.

In conclusion, I would emphasise this suggestion as being, in my judgment, essential to the success of any scheme having for its object the solution of a problem in which a knowledge of human-kind is of close secondary importance to the possession of more obvious qualifications.

Discussion.

Mr. Hugh Begg, County Veterinary Inspector for Lanark, said that he could not agree quite with Mr. Spencer and others who believed that the solution of the milk problem rests entirely in the eradication of tuberculosis from our herds. Mr. Spencer had said that tuberculosis remains entrenched because we could not afford the cost of turning it out. How did he interpret the word " cost " ? Was it simply a financial problem that merely tested our willingness to part with money? Surely not. The veterinary profession could eradicate tuberculosis from our herds if that were a clean-cut issue, and steps both sure and effective could be taken at once towards that goal over the whole country, but they would involve an insupportable interference with our milk supplies. Eradication work could only be done gradually, using meantime the full powers of present legislation, and by and by such amplifications of it as were deemed necessary for carrying the campaign nearer to its goal. Many local authorities spent enormous sums yearly in the establishment and maintenance of tuberculosis hospitals and sanatoria, and at the same time evidently grudged the small expense of veterinary service essential to the detection of cows that were daily infecting our children. Last year, in an attempt to envisage what the next competent extension of the Tuberculosis Order might be, he suggested the " killing out of all cows over ten years' old unless certified to have passed the tuberculin test, and the reduction of the age limit later on, as and when the exigencies of the milk situation permitted it." The effect of that would progressively and increasingly be to ensure the rearing of young stock on milk supplies becoming more and more free of tuberculosis infection, since the producing animals, owing to their youth, would be less likely to be affected with tuberculosis of the udder or other open forms of the disease. Aged cows were mainly responsible for the spread of tuberculosis, and 75 per cent. of our cases of udder tuberculosis were met with in old cows. He had repeatedly known infected herds, which were self-supporting, emerge tubercle-free by the simple expedient, innocent of design against tuberculosis on the owner's part, of contriving an important part of income from the sale of all cows at the height of their value when due to calve for the second or third time.

Mr. A. Gofton, Chief Veterinary Inspector, Edinburgh, remarked that Scotland was proud of the fact that for nearly twenty-five years it had carried on a systematic procedure of inspection of cows and cow sheds in all burghs. It was true that under the Act of 1903 it was within the discretion of local authorities in Scotland to adopt powers or leave them alone, but, with the stimulus of the Board of Agriculture, the authorities appointed veterinary officers. The ground was thus well prepared for the coming into operation of the Milk and Dairies (Scotland) Act in 1925. There were 33 counties in Scotland; in 12 of them full-time veterinary officers or whole-time veterinary staffs were engaged almost wholly in the work of dairy inspection. In Edinburgh there had been a very marked improvement in the milk supply. He would be very sorry if the picture Mr. Spencer had drawn of conditions in England were equally applicable to conditions in Scotland.

Major Alex. Douglas, County Veterinary Officer, Ayr, said he did not think existing laws could be condemned so thoroughly as Mr. Spencer had condemned them until they had been fairly tried. The attitude of the Ministry of Health in connection with routine inspection had been most unfortunate, and there was no doubt that a number of local authorities were sheltering behind that attitude. The inspection of dairy herds was obligatory in Scotland at least once a year, and he believed it was justifying its cost. Advocating a voluntary scheme of inspection, Major Douglas said he did not agree that owners had absolutely no responsibility for the incidence of tuberculosis among their herds. With regard to a suggestion by Mr. Spencer that in a scheme for a State veterinary service part-time inspectors should work under a county or area whole-time chief, Major Douglas expressed the view that full-time inspectors should be employed. " What we want in the task ahead of us," he said, " are men who are going to devote the whole of their time and energy to this work."

Captain Robert Simpson, Chief Veterinary Inspector, Cumberland, said while there was agreement on principles there was considerable difference of opinion as to procedure. Legislation for England and Wales was of a very makeshift character; Scotland had always led the way in public

health questions. Cumberland had attempted routine inspection, but actually only six English counties, as was pointed out in another paper, had adopted it. There was a difficulty arising out of the separation of the Sanitary from the Veterinary administration. This led to confusion. Take the matter of bad housing—that had to be dealt with under the dual administration. Some of these byres and cowhouses were veritable breeding grounds of disease. The improvement of the housing had been delayed on account of the ignorance of those to whom it had been referred. Far too much importance had been attached to air space and far too little attention had been paid to the reconstruction of existing byres. Visits of inspection were useful occasions not merely for the immediate purpose of the visit, but as opportunities for educative talks. They could discuss the maintenance of clean and healthy herds. An important question was that of what should be done with a cow affected with udder tuberculosis. She might not react, and the presence of the trouble might not be in itself a sufficient reason for destroying the animal. In his argument for a field service campaign to destroy tuberculosis Mr. Trevor Spencer had, he thought, rather minimised the value of work which had already been done. He agreed that the State should take some interest in the matter. The present designations fell far short of the ideal. The problem of stamping out tuberculosis was national rather than local. In the main only a small quantity of milk produced was consumed locally : it went far afield. Therefore the cost of a field service should be an imperial and not a local charge.

Professor J. SHARE-JONES, Liverpool, held that one consolidated Act was required to deal with all the animals, their products, and their by-products. While the other speakers had been generally in measure adversely critical of Mr. Spencer's propositions, Professor Share-Jones supported him unreservedly. "In addition," states *The Scottish Farmer*, "we should be disposed to give the Liverpool professor the palm as the best speaker in the Congress."

Mr. STEELE-BODGER, Midland Counties Veterinary Medical Association, said that he stood there neither as a whole-time nor a part-time inspector, but as one of that large body of practitioners who suffered from both of them. and of the two he found the whole-time man the lesser evil. They had listened that afternoon to the good that had been and would be done by both whole-time and part-time inspectors, but not a word had been said about the general practitioner who held no inspectorships—was he of no account in the clean milk camapaign ?—if he did count, where was his reward ?

In his district they had fifteen licences for graded milks, every one of which was the result of his initiative ; with one exception all were his clients ; he had made application for the licences, taken the milk samples, advised as to alterations necessary and as to methods and, when all was ready the local inspector visited the farms and collected the fees for examination—why should he do all the spade work and then put £100 a year into another man's pocket ? Again, if his certificate was good enough for the Ministry of Health in respect of Certified and Grade A (T.T.), the higher grades, why should it not be good enough for the lowest grade ?

Much had been said of the 'local knowledge' of the veterinary inspector ; what of the local knowledge of the practitioner who was not a local inspector ? It often happened that the local inspector had but a small minority of the clientèle of his particular district—where, then, was his local knowledge ?

The same applied also to the Tuberculosis Order—he was sick of local inspectors and so were dozens of practitioners. He wanted to see fair play for everyone.

Mr. Steele-Bodger also emphasised the importance of fresh nomenclature for the various grades of milk, which should be distinct and easily understood by the consumer. Grading should be compulsory, not permissive.

Proceedings of the Veterinary Section of the World's Dairy Congress, 1928.

By H. W. STEELE-BODGER, Tamworth.

We must congratulate ourselves as a profession upon having had a special section at the World's Dairy Congress, and I am sure that no better chairman could have been found than Colonel Brittlebank.

The choice of subject for such a congress is highly important.

In Mr. Noel Pillers and Mr. Trevor Spencer we had distinguished examples of the whole-time and the part-time veterinary inspectors, and each made a strong appeal for his point of view.

Mr. Noel Pillers' paper made very stimulating reading, he had marshalled his facts well, and his references were unimpeachable.

One was extremely glad to read Mr. Pillers' logical remarks regarding pasteurisation, and when he states that "pasteurisation is the very antithesis of 'clean milk' as we understand it today," he hits the nail fairly on the head. Various journals have given prominence to Sir George Newman s remarks advocating pasteurisation—they have omitted, however, for reasons best known to themselves, to mention that Sir George Newman stated that pasteurisation could never be an alternative to clean raw milk, and that he advocated pasteurisation only as a safeguard in the case of large cities such as London until such time as the transport of milk should be improved.

It is worthy of note that it was left almost entirely to the veterinary profession in this country to take up the cudgels for clean raw milk ; possibly because we have no commercial interest in the marketing of milk.

Mr. Pillers rightly points out the danger there may be in pasteurised milk when the distributor endeavours to retain a good cream line by low temperature pasteurisation. As a result of recent experiments at the National Institute for Research in Dairying, at Reading, it has been found that virulent Tubercle bacilli were found in milk pasteurised at only 143° F., and that when the temperature fell to 138·5° F., twelve out of fourteen samples of milk known to contain Tubercle bacilli were virulent after pasteurisation. As a body intimately associated with milk production we know the possibilities of contamination of milk at the source, but as men of science we know that once the contamination has taken place nothing in the world will ever make that milk clean. It is obvious then, that as a profession we ought to advocate clean production rather than pasteurisation of dirty milk.

As veterinary surgeons who are constantly witnessing the act of milking we know that at present pasteurisation is an incentive to slovenliness in milk production. Milk producers must have an incentive before they will produce clean milk and that incentive does not rest only with the lay public to demand something better ; it rests in the first place with the distributors of milk to purchase milk on a quality basis. We agree that the public at present are not prepared to pay enough for really clean raw milk, but one must not forget that for years they have, in our opinion, paid far too much for really bad milk. Extraordinary interest was aroused at the Congress as the result of a paper entitled "Purchasing milk on a Quality Basis," read by the Managing Director of a famous Midland firm of milk distributors. It is to be hoped that this interest will not end at the Congress, and that the example will be widely followed. If milk was paid for on butter fat and absence of coliform bacilli we should soon have an improved milk supply.

The majority of the speakers at the veterinary sections were of the opinion that the alpha and omega of a pure milk supply was the elimination of the tubercle bacillus, at least so far as the veterinarian is concerned. This is not so, of tremendous importance also is the elimination of coliform bacilli, the absence of which is a far greater guarantee of cleanliness in milk production than is the absence of the tubercle bacillus ; and the presence of which may cause

much disease in children. Probably none has a better opportunity than the country practitioner of pointing out the dangers due to the presence of coliform bacilli and the best methods of securing its absence.

This brings us to another point. All the speakers were agreed that the milk problem was national and not local, that is generally accepted. How then can it be dealt with by either whole-time or part-time inspectors, or even by whole-time and the present part-time inspectors? If the problem be a national one it is essential that every member of our profession should play his part: it is essential, therefore, as pointed out by one speaker, that the veterinarians who are neither whole-time nor part-time inspectors, but who form a large part of the country practitioners should be encouraged to play their part. At present they receive no encouragement but are rather discouraged—this is an anomaly which must be rectified. One cannot expect the practitioners who are not inspectors to be the only philanthropists. As I see it, a whole-time veterinary service is both essential and desirable to advise and supervise all veterinary surgeons who are associated with milk production and the health of dairy stock, and to co-ordinate their efforts.

I am glad, also, that Mr. Pillers emphasised the absurdity of the present designation of graded milks. This is a matter of the very greatest importance to our profession for, so long as Grade A and Grade A (T.T.) milks are so easily confused, farmers will not make an effort to produce the latter grade.

Recommendations from the various divisions of the "National" on this subject would be welcomed. Sir George Newman has agreed that the present nomenclature is unsuitable and misleading, and has given his assurance that he will personally see that recommendations as to a suitable classification of milk shall receive the attention of His Majesty's Government—this is an opportunity for the veterinary profession to give a lead. It is essential that grading shall be compulsory and not merely permissive, or at least that ungraded milk shall be definitely labelled as such.

I agree that some such classification as suggested by Mr. Pillers is desirable.

Many veterinarians, especially country practitioners, will agree that diseases other than tuberculosis are of the very greatest importance and cause the gravest concern to milk producers. Major Dunkin mentions Johne's disease and to this we would add contagious abortion. It is possible that Johne's disease is the biggest deterrent to the breeding and rearing of pedigree stock that we have to contend with, and in many districts it is a far more serious problem than tuberculosis, affecting as it does chiefly the animals which have not had an opportunity of repaying the farmer for the trouble and money spent on rearing.

Mr. Spencer's paper was a review and trenchant criticism of the existing legislation concerning milk, some of it received severe handling by subsequent speakers, but much of it was indisputable, and it is to be hoped that it will find its way to responsible quarters, and that some of it will bear fruit.

The inadequacy of the existing Tuberculosis Order is generally admitted; an act which gives the farmer 45s. for an animal whose market value is 20s. is not likely to effect much improvement in the way of eliminating tuberculosis.

One cannot fail to see the good sense of Mr. Hugh Begg's proposition that all reacting cows over ten years of age should be slaughtered. Anyone familiar with the *post-mortem* findings of these old cows is aware of the vast amount of disease they must disseminate.

Mr. Gofton was justifiably proud of the lead which Scotland gives to England in matters appertaining to public health and he was in no wise disposed that the gloomy views expressed by Mr. Spencer should be broadcast throughout the world as the true state of affairs in Scotland. If our English counties had only the same initiative as Lanark County for example, and if our veterinary represen-

(*Continued at foot of next column*).

The Veterinary Record

18th August, 1928.

COMMITTEE ON THE RECONSTRUCTION OF THE ROYAL VETERINARY COLLEGE.

We published in our last week's issue the announcement that at the request of the Governors of the Royal Veterinary College, Camden Town, the Minister of Agriculture and Fisheries has appointed a Departmental Committee under the Chairmanship of Sir C. J. Martin, C.M.G., D.Sc., F.R.S., Director of the Lister Institute:—

> "To consider and report generally on the reconstruction of the Royal Veterinary College, and in particular on the questions what accommodation should be provided, having regard to the training to be given; whether that accommodation can and should be provided on the present site; if not, where the College should be transferred."

It is to be regretted that in the constitution of that Committee, consideration has not been given to the claims of the general practitioner.

Surely an investigation of this kind, involving as it does considerations of vital importance to the educational requirements and training of veterinary surgeons, cannot be carried out efficiently without the help of representatives of general practice.

It is to be assumed that the Principal of the Royal (Dick) Veterinary College will represent the institutional side, and that the national services will be looked after by the Chief Veterinary Officer of the Ministry of Agriculture, on the one hand and the Director-General of the Army Veterinary Service on the other, but the requirements of general practice are after all the most important questions which the Committee will have to deal with, since more than

(*Continued from previous column*).

tatives had the same influence as has the veterinary inspector for that county, a very different tale might be told as to the progress made.

I must agree with Professor Share-Jones that one consolidated Act is required to deal with all the animals, their products and their by-products—in this way much confusion and much overlapping would be avoided, and the veterinary profession would surely come into its own. Let us, however, first put our house in order and be sure of what we want. Above all let us be sure that what we want is fair to all the members of our profession and will not favour one section more than another, so that an individual may be sure that he will reap the harvest—financial and otherwise—of the good which he has sown.

75 per cent. of our graduates become general practitioners.

It is to be hoped, therefore, that it is not too late to remedy this, and we would suggest that the Committee would be enormously strengthened by the inclusion of a member especially representative of general practice.

Moreover, there is no representation on the Committee of the two Corporate bodies which alone represent the profession, namely, The Royal College of Veterinary Surgeons (of which the institution in question is an affiliated School), and the National Veterinary Medical Association.

In our opinion representatives of these two bodies ought to have been included. Only in this way can we hope for a satisfactory solution of the difficulties with which the School is contending.

Animal Diseases in Elizabethan Times.

Mr. Colin Matheson, of the Department of Zoology, National Museum of Wales, writes as follows, under the above heading, in a recent issue of *Nature*:—

"While looking up certain references for a paper now in course of preparation, I recently came upon some interesting data in Prof. E. A. Lewis's 'The Welsh Port Books' (London, 1927), with regard to live-stock epizootics in Ireland in the time of Queen Elizabeth.

"As is to be expected, the Welsh Port Books record numerous importations of animals and animal produce from Ireland—plough-horses, cattle, wool, hides, etc., and of course considerable quantities of fish. But the most interesting items are those relating to the import of 'murrain sheep skins.' Totalling up these items for the period Michaelmas 1593 to Michaelmas 1594 (Port Book K.R. 1299/5), we find that no less than 15,100 'morkins' or 'murren sheepskins' were imported from Ireland to the port of Milford. Again, we have a single cargo containing '2,000 morkins being murren sheepskins'—that of the *Rioll Defence* of Milford, trading to that port from Ireland in May, 1599. In March, 1601, there were imported from Waterford to Milford 300 murrain sheepskins, and in July, 1602, from Wexford to Milford, '100 murrain sheepskins and 250 murrain lambfell and kidfell.' Altogether, therefore, during the ten years 1593—1602 there are records of the import of 17,750 'murrain skins' from Ireland.

"The term 'murrain' has always covered a variety of epizootics, including probably anthrax, foot-and-mouth disease, etc., and if in the present instance it includes cases of microbic diseases, the above figures throw an interesting light on possible means of dissemination. But from the heavy incidence on sheep, and the absence of any reference to diseased cattle or other livestock, one may perhaps suggest that *Fasciola hepatica*, the sheep liver-fluke, was the main source of the damage. This parasite would of course always tend to flourish in such a wet country as Ireland, and especially in such a marshy and undrained Ireland as that of the sixteenth century. One of the earliest epidemics mentioned in history is that which appeared in Holland in 1552, and which Gemma called 'lues infanda pecoris.'

"The matter is being investigated further, as it would seem to be of some importance in the history of animal diseases in Great Britain."

CLINICAL AND CASE REPORTS.

Purpura Hæmorrhagica (?) following Distemper in Greyhounds.

By Hamilton Kirk, M.R.C.V.S.

For some time past I have intended to record a disease in Greyhounds to which, formerly, I had difficulty in attaching a label. Perusal of Mr. Wentworth Elam's article on pneumo-gastro-enteritis, however, has stimulated me to capitulate what I have observed among the continually-changing kennel of 250 Greyhounds under my charge. The description of an outbreak, as given by Mr. Elam, with the exception of small portions of the paragraphs on "Symptoms of the respiratory and alimentary types" is a complete and true picture, in every detail, of distemper. Such variations as he alludes to are all equally common to distemper, and I believe he has been dealing with an acute type of that disease in which certain characteristics are predominant in consequence of the contagium being of one particular strain.

It is common knowledge how different outbreaks of distemper will assume different characters, and it is not difficult to appreciate with what ease a certain type could be perpetuated amongst a breed like the Greyhound, when one realises how every member of the breed is constantly moving from one Greyhound course or establishment to another.

Mr. Elam seeks to establish that Irish Greyhounds are more susceptible to this particular disease, when they reach this country, than are the Greyhounds born and bred here. This might be truly explained by the fact that any exotic animal will be far more susceptible to diseases which in another country run only a comparatively mild course. We know, for instance, how difficult it is successfully to treat distemper among such exotic breeds as the Japanese Spaniel, Pekingese, or the Alsatian, etc.; and probably if English bred Greyhounds were shipped to Ireland, they in turn would readily contract acute forms of disease to which they would, at home, be far more resistant.

Mr. Elam states that the virus of pneumo-gastro-enteritis differs from that of distemper, and that it is more virulent in its action. It would be interesting to know wherein lies the difference? As regards the virulence of the virus, that of distemper is also very variable, even in one locality, and depends upon many circumstances. It is when Mr. Elam refers to hæmoptysis, blood-stained nasal discharges, dysentery, and gangrene of the gums, tongue and other mucous membranes, that I begin to see some similarity between his cases and those which have occurred in my practice.

Symptoms of Outbreak. I will now endeavour to describe the clinical symptoms and morbid anatomy of an affection with which I have been dealing for the past four months, and I invite readers who are sufficiently interested kindly to give me their opinion as to whether the disease is really a purpura hæmorrhagica, an acute distemper, or Stuttgart disease.

The onset of an attack is often very similar to that of an ordinary case of distemper, the substantive symptoms being diarrhœa, ocular or nasal discharge (or both),

depression, muscular weakness, lassitude. and fever ranging from 102° to about 104°. Occasionally there is a short soft cough, sometimes amounting (as Mr. Elam points out) to nothing more than the puffing out of the cheeks. Generally such a case, when uncomplicated, has progressed to a favourable termination within about a fortnight. But I have never been surprised to receive a a telephone message to the effect that such a case has commenced " passing blood." I have come to learn, too, the seriousness of such news, for unless immediate steps are taken, the result has usually been fatal.

One of my earliest cases, before I had learned to cope adequately with the condition, was that of a Greyhound which had shown no particular symptom other than depression, loss of appetite and weight, diarrhœa, &c. for a week or more. Perhaps, however, I should mention that the dog had a marked thirst.

Then I received a midnight message that he was prostrate and dying. On arrival, I recorded that the pulse was 160, temp. 101·2, mouth and gums cold, a blood-stained line ran along the teeth, the molars were coated with a chocolate-coloured slime; there were gingivitis, congestion of the ocular mucous membrane and a speck of blood was found on the thermometer; the fæces were hard, pasty and black, and emaciation and depression were extreme. The patient and everything connected with him had an intensely putrid odour. He died the same night and decomposition was exceedingly rapid.

This clinical picture was substantially the same in the majority of cases.

The next case exhibited no warning symptoms and was found dead. A third dog died with similar suddenness. Another showed nothing suggestive of distemper, but was obviously ill and very quickly exhibited the dreaded hæmorrhagic symptoms. These latter consist of the forcible expulsion of quantities of bright-red blood, or of deeply blood-stained fluid per anum; or hæmatemesis; or merely the passage of dysenteric motions. One particular hound must have passed a half-pint of blood prior to my arrival. In other cases the voiding of small quantities of blood by mouth or bowel has been continuous over some days. Hæmatemesis, in my cases, has been fairly common—which is contrary to Mr. Elam's experiences; and the mortality in the early days was something like 60%.

In several instances there were extensive œdematous swellings about the head, neck and breast, but none of the dogs affected in this way died.

Morbid Anatomy. With hardly an exception, the *post-mortem* appearances have been identical. Almost every organ and mucous membrane has been congested, sometimes moderately, sometimes intensely, but mostly to such an extent that the vessel walls have disrupted over large areas, thus permitting the escape of alarming quantities of blood into the serous cavities. Pure blood has been found in the abdominal cavity, varying in amount from about 2 ozs. to 14 ozs.

In some instances the visceral peritoneum has been intensely injected; in others, the mucous lining of the bowel has had the appearance of bovine bowel affected with Johne's disease. The lungs, pleura, pericardium, kidneys and, in fact, almost every part has been charged with blood. In addition, the gums and conjunctivæ have been deeply injected, and hæmorrhagic spots have been detected inside the nostrils. The body usually becomes so emaciated during the last few hours of life that it is reduced to little more than a skeleton. The stomach and bladder have rarely been the seat of any detectable lesion, whilst hæmorrhagic enteritis has been common.

Diagnosis. It has been suggested that the cause of the condition is a hæmolytic streptococcus; others think it is due to the *Bac. coli*, but I have so far failed to discover what organism actually is responsible. Dr. Hare examined the viscera of one or two cases for me but, as he explained, it is very difficult to come to a definite conclusion when so many organisms are present, as is the case several hours after death. Histologically, too, nothing has as yet been discovered.

The name I first applied to the condition was hæmorrhagic enteritis, which really is only another name for Stuttgart disease. This did not seem to be an unreasonable diagnosis, for the following reasons:—(1) the condition is apparently not very infectious or contagious; (2) the mortality is high and death very rapid in many cases; (3) hæmorrhages from the bowels, nose and mouth, suggested typhus—although I had not encountered necrosis of the tongue, etc. I ascribed this to the known fact that when Stuttgart is acute there is no time for necrosis of local areas to occur, death supervening too quickly. One factor which seemed somewhat to negative this diagnosis was the fact that emesis was not always a prominent feature, nor was the stomach often the seat of lesions.

I have wondered whether the disease could be an acute hæmorrhagic form of distemper, in view of so many cases having succeeded what appeared to be typical attacks of distemper.

More recently, I have leaned to the opinion that the condition might well be described as purpura hæmorrhagica, basing this opinion upon the following data:—(1) Purpura usually follows some other disease, which, in this outbreak, was distemper—a malady sufficiently lowering to permit of any other complication ensuing. (2) Purpura is essentially associated with blood extravasations or petechial hæmorrhages. (3) It causes extreme debility and emaciation. (4) It is very fatal, and (5) It is noted for the accompanying œdematous swellings of various parts of the body. Such swellings were observed in several Greyhounds.

Pneumo-Enteritis of Puppies.

Professor W. L. Williams' Comment on Mr. R. H. Smythe's Report.

In the August, 1928, issue of *Veterinary Medicine*, Chicago, the Clinical Report " Pneumo-Enteritis of Puppies," by Mr. R. H. Smythe, M.R.C.V.S., is reprinted from the *Veterinary Record* of March 24th, 1928, with the following comment:—

" A condition, which one must conclude from the description is the same, occurs in American kennels although not to the extent that it prevails in the district in which Mr. Smythe practices. It has been observed, however,

with considerable frequency in Kansas City. The description all through is so typical of infectious abortion in other animals, that Prof. W. L. Williams was asked his opinion of the matter. His comment follows :—

" ' Replying to your letter of the 31st May, enclosing contribution of R. H. Smythe to the *Veterinary Record* of March 24th, 1928, entitled "Pneumo-enteritis of Puppies," you are doubtless well aware that I am not particularly familiar with canine diseases. What Smythe describes apparently represents genital diseases in general. The expulsion of dead fœtuses at all stages of gestation is a phenomenon common to all mammals. Far more fertilised ova die *in utero* than are born. Most of them die so early that they undergo resorption or are expelled when so small that the pregnancy is not usually recognised and the phenomenon is designated sterility.

" ' Smythe indicates that the deaths of puppies are most common in pedigreed animals. This is the rule in all species of mammals and rests upon fairly well-known causes.

" ' Smythe states that the puppies die chiefly of enteritis with diarrhœa or from pneumonia. Diarrhœa and pneumonia cause most deaths of new-born mammals of all species. The functions of the digestive system are suddenly and materially altered at birth and may give way to the new strain. Smythe records that in the fœtuses expelled dead at term, the enteritis was already present, but he is silent upon the question of fœtal diarrhœa. Fœtal diarrhœa is almost universal in bovine fœtuses which are aborted ; the same is true in sheep according to my observations, and is represented generally in equidæ by over-distension of the intestinal tract with meconium. Pneumonia is highly common in calves, but naturally not in fœtuses.

" ' So far as I have observed, the bovine fœtus is especially prone to diarrhœa. In slaughtered, pregnant cows, diarrhœa is observed in fœtuses ten inches long, its frequency increases as gestation advances, it is very common as term is neared, is not rare at time of birth, and sometimes when the amniotic cavity contains quarts of fœtal fœces the fœtus has apparently overcome the diarrhœa and is viable when born. The diarrhœa present at birth may rapidly produce death, or the young born without diarrhœa may break down with fatal or non-fatal diarrhœa within a very few hours. If the fœtal membranes of such a fœtus are examined, extensive placental lesions are present and these represent corresponding lesions of the endometrium.

" ' As Smythe suggests, the diarrhœa of the new-born is of antenatal origin. It is clearly referable in the very early cases to endometritis of the mother. Moreover, in the cow, when the endometritis becomes critical, the most striking phenomenon *in her* is severe diarrhœa.

" ' Diarrhœa and pneumonia, then, are common phenomena of critical disease in the new-born, and diarrhœa is a common phenomenon of the diseased fœtus. The rule appears applicable to all mammals, with the limitation of the equine fœtus and the foal where constipation displaces the diarrhœa until some days, or at least some hours, after birth.

" ' Smythe makes the significant observation that the bitch repels the sick puppy and refuses to permit it to suck. The ewe shows the same repulsion for a lamb born with diarrhœa. Much has been written regarding the repulsion of the new-born by the dam. The sow varies this attitude by becoming a cannibal, or a scavenger (?) and devours her young. Sometimes this repulsion of the young is unquestionably due to the fact that it is diseased in such a manner and to such degree that the mother recognises the young as unnatural and consequently outside maternal attachment. The sow is a natural scavenger and logically devours anything repulsive which comes within her field. It is not at all impossible that most instances of the refusal of the dam to care for her young is owing to the presence of important disease, and the mother takes no worry from the fact that the disease of the fœtus was derived from her own uterus, and perhaps that she in turn, acquired it from the sire.

" ' The suggestion in your communication that the phenomena described by Smythe may be ' similar to abortion disese in swine ' cannot be directly answered, because no adequate definition has yet been formulated for abortion disease. It is now generally held that Bang's bacillus causes undulant fever in man and is frequently present in fistulous withers in geldings, yet it would be straining our language to dub undulant fever or fistulous withers as ' abortion disease.' So far as definitely recorded, all abortions are due to, or at least associated with, endometritis, and inevitably with fœtal placentitis. Endometritis may be present in a location, or in a degree, which does not result in abortion. Instead the fœtus may be born seriously or mortally infected, as appears to be the case in Smythe's cases. Whether the expulsion of dead fœtuses at term, or the birth of mortally infected young should be termed ' abortion disease ' is purely a matter of taste—or of definition.

" ' Your observation that fox breeders are complaining of the frequency of the expulsion of dead, along with living, fœtuses at term or of small litters and your belief that the difficulty is primarily nutritional, gives room for considerable discussion. There seems to be some danger of confusion in this respect. As stated above, all cases of abortion recorded, where observations have been definitely stated, have been associated with endometritis and fœtal placentitis or chorionitis. The lesions are those commonly associated with the ravages of bacteria. It is largely, if not generally believed that lowered vitality of an animal increases its vulnerability to bacteria or other forms of virus present. The vitality of an animal or of an organ may be so low that bacteria commonly present, but not visibly harmful, may be enabled to invade seriously the host. On the other hand, there may be introduced through a variety of channels, a quantity or quality of virus which may overpower most of the strongest animals, as in anthrax. It appears to me safer and clearer to say that in the one instance the *dominant* factor is the volume or virulence of the infection, in the other, the power of resistance in the animal ; but in each case both factors are playing their rôle. Looking at the matter from this standpoint, one is quite justified in concluding in one case this factor, in the other, that cause, plays the more important part.' "

EXTRACT.

Trypanblue and certain Dithio-Aniline Derivatives: Their Efficacy in the Treatment of Piroplasmosis and other Affections in the Central Provinces.

By Major R. F. STIRLING, F.R.C.V.S., F.R.G.S., D.V.S.M., I.V.S., *Second Superintendent, Civil Veterinary Department, Central Provinces.*

INTRODUCTION. Piroplasmosis, or tick-fever, is the most widespread infection of animals in the Central Provinces. So far as we know at present, mainly from the recent surveys undertaken by the Muktesar Institute, the cattle of India are commonly infected with two species of piroplasms, namely :—

(*a*) *Piroplasma* (*Babesia*) *bigeminum*, the cause of tropical redwater, or Texas fever.

(*b*) *Theileria mutans*. This small piroplasm is now known to be found almost everywhere among Indian cattle, and it is generally held that it sets up no clinical symptoms. This type of infection is stated not to yield to the effects of trypanblue.

The piroplasmosis of the canine population of India is also known to be caused by two different species of parasites :—

(*a*) *Piroplasma* (*Babesia*) *canis*, the cause of the so-called malignant jaundice. Infection with this piroplasm has long been known to yield in a remarkable manner to trypanblue.

(*b*) *Piroplasma gibsoni*. The affection caused by this much smaller piroplasm differs clinically from that caused by *P. canis*, in that it is usually more prolonged in its effects and the symptoms are generally those of a progressive anæmia, with a frequent tendency to relapses at prolonged intervals. It is known to be surprisingly common now in many parts of India. It does not respond, it would seem, to trypanblue, but good results may be obtained by repeated treatment with certain arsenical preparations, notably tryparsamide.

TRYPANBLUE. 1. *Preparation of Solution.* The brand of trypanblue recommended is the *trypanblau* manufactured by the German firm, Merck, of Darmstadt. The drug supplied by this firm is eminently superior in properties to the products the author has been able to secure elsewhere. In the years 1921 and 1922, supplies were obtained from a British firm for trial, and they were found to be less soluble than the German product and frequently became gelatinous in solution on cooling.

The drug, which is a blue dye, of the aniline dye series, is made up in 2 per cent. solution in water. The powder is weighed out into a mortar, and finely triturated with a small amount of cold water into a paste; more water is then gradually added until the dye enters completely into solution, which is then made up to the desired bulk. The solution is next passed through ordinary filter paper, and the filtrate collected in a wide-mouthed flask, which is afterwards placed in an autoclave maintained at 120°C. for 20 minutes. When the solution in the flask has cooled, it is distributed into sterile bottles, which are then carefully sealed and despatched to the District Veterinary Assistant Surgeon staff as required.

2. *Dose.* The dose administered is 40 c.c. for horses and cattle, and 5 to 6 c.c. for dogs. These doses may appear to be rather low. The cattle of the Central Provinces, however, are generally of a small type, and as the drug is usually employed upon animals that are much sunk in condition, it has been considered prudent to recommend for adoption a dose rate somewhat lower than what is sometimes recommended in treatment. Larger doses were sometimes followed by symptoms of dyspnœa and temporary collapse, and although these symptoms passed off without untoward incident to the animal itself, they caused alarm in the mind of the villager, who might be easily led to refuse further treatment of his animals after the experience. The smaller dose was therefore deemed adequate, to be repeated after an interval of a few days to a week at longest.

3. *Mode of Administration.* When the drug was first issued, it was administered by subcutaneous injection. Steps were soon taken, however, to train the subordinate staff in the proper method of administering of it by intravenous injection. With the adoption of the requisite precautions regarding sterility at the time of injection, the formation of abscesses became increasingly rare. When abscesses did occur, they could nearly always be traced to lack of cleanliness on the part of the operator and in the dispensaries.

While the possibilities of the drug were being explored during the first year it was on trial, some interesting practical information was obtained upon the subcutaneous injection of trypanblue into dogs. Wallis Hoare (*System of Veterinary Medicine*, Vol. I, page 1032) recites the African experience that injection in this way is attended with untoward consequences in dogs as " there was a great tendency to abscess formation if aseptic precautions were not taken." The experience we gained in the course of our work was similar, so long as the injections were made into the inner, flat surface of the thigh. The proneness to abscess formation at this site was thought to be associated with the likelihood of the animals conveying infection from their anal and genital region to the seat of injection by repeated licking of one part and then the other, and so various other parts of the body surface were tried for inoculation. It was found that abscess formation became extremely rare when the sites chosen were either subcutaneously on the side of the neck, or intramuscularly by deep injection into the gluteal muscles. In fact, abscess formation then was no more common than in the larger animals after inoculation of the drug, and when it did occur, it could be traced to the neglect of elementary precautions in the observance of sterility of the kind already mentioned.

At the present time, the method of administering the drug is entirely by intravenous injection, except at a few outlying stations where the Veterinary Assistant Surgeons have not yet been trained in the proper technique. In the larger animals, the jugular vein is selected for injection, and in dogs the external saphena vein.

4. *Clinical Results.* After an extensive trial had been given to the treatment, over five years, the Veterinary Inspectors and Assistant Surgeons were requested to furnish detailed reports upon the results achieved by them in the course of their experience. Unfortunately, it is not

practicable to publish in this short article their communications *in extenso*, and so striking records, numbering over a hundred, have perforce to be omitted. It is believed, however, that the efficacy of the treatment is fairly summarised in the following excerpts from the reports. In general, the reports dealt with the treatment from two standpoints, namely, first, as a cure for acute piroplasmosis, and, secondly, as a restorative in chronic affections manifested by symptoms of debility.

(*a*) " Its general value as a tonic is undoubtedly a great one. Many unthrifty animals put on condition after one or two injections of trypanblue and its use is getting very popular with cattle owners. In milking cows, injections result in a better yield of milk and the quality and quantity of the butter is increased considerably. I have found it very useful in cases of chronic skin affections in dogs."

(*b*) " Its value as a general tonic is unparalleled. There have been many instances in which animals have shown wonderful improvement in condition after one or two injections.

(*c*) " In acute cases an injection of trypanblue almost immediately brings down the temperature and clears the blood of piroplasms. Even if the blood is still free after seven days, a second dose should be given. The present dosage is sufficient. In chronic cases, at least three doses are necessary at intervals of a week, or earlier if the mucous membranes show no blue staining. As a general tonic it is much more useful than iron, arsenic, etc. Milch animals, which give an inferior quality of milk in spite of good food and tonics, yield a large quantity and a better quality of milk after injection. In two recent cases, a cow and a she-buffalo which had dried up almost entirely owing to unknown causes started to give milk after the first injection. I am of opinion that for all debility cases trypanblue should be adopted as a routine treatment whether parasites are found in the blood or not."

(*d*) " In acute cases of piroplasmosis early treatment with trypanblue has been found efficacious in over 95 per cent. of cases. I have treated many cases of indolent ulcer, which defied all ordinary treatment, by means of trypanblue injections combined with external dressings of an ordinary kind. Other chronic diseases of a constitutional nature such as recurrent colic and tympanites showed rapid resolution when the dye was used in conjunction with ordinary medicaments which by themselves had failed to effect resolution."

An inspector reports that although he obtained excellent results with the drug in indigenous breeds of cattle, he failed to obtain results that were equally striking in animals that were either imported stock or the progeny of imported stock mated with the local cattle.

5. *Action on Foot-and-Mouth Disease.* In 1923, injections of the drug were tried upon animals in the scene of outbreaks of this disease. It was found that when the drug was administered during an early stage of the disease, while the animal was exhibiting an acute febrile reaction to infection, rapid improvement took place, and the length of time that elapsed between the first appearance of symptoms and eventual complete resolution was curtailed by a half in the treated animals. The drug, however, was found to have no prophylactic action. It is of interest to note that Davidson (*Veterinary Journal*, 1924, Feb.) has reported similar results with the use of the drug in Hong Kong.

6. *General Remarks.* From these observations, it may be inferred that the utility of trypanblue in the treatment of piroplasmosis, of the acute and chronic types, has received confirmation in practice in the Central Provinces. The results that may be expected from its use are in no wise surpassed by those reported to have been obtained in other countries. Further, in the numerous cases of chronic debility, slowly healing wounds, and other local manifestations of a probable systemic disturbance, the exhibition of the drug may be followed by rapid clinical improvement, whether piroplasms are readily demonstrable by microscopic examination in the peripheral blood or not. The utility of the drug in the treatment of animals affected with foot-and-mouth disease, in its early stages, has also been confirmed.

INTRAMINE. In 1922, the writer's attention was attracted by Mr. A. G. Dix, I. E. S., to a report upon a new basic aniline dye prepared by Dr. H. H. Hodgson, College of Technology, Huddersfield; this dye appeared to be allied to the intramine referred to by MacDonagh in his Hunterian Oration (1916), entitled " Links in a Chain of Research on Syphilis." At the author's request, Dr. Hodgson kindly despatched to him samples of certain dithio-anilines for trial. Some of these compounds were soluble only in solutions of sodium thiosulphate or caustic soda, but later samples were received that were soluble in water alone. The preparation known as intramine, although it is referred to here as a dye, is in reality a colourless substance, and it is administered in one per cent. watery solution.

During the years 1923 and 1924, a series of experiments was carefully executed upon these drugs to test their efficacy in piroplasmosis, trypanosomiasis, and foot-and-mouth disease. It would extend beyond the limits of this short contribution to reproduce in detail the records of these experiments, which can, however, be readily furnished on request by the author for scrutiny.

The total number of animals treated in hospital for piroplasmosis was 38, namely, 6 ponies, 12 cattle, 3 buffaloes and 17 dogs. The chemical substance designated intramine was administered both subcutaneously and intravenously. Smear preparations of the blood of these animals were examined daily microscopically, and temperature readings taken. It was found that the piroplasms disappeared from the blood stream within 24 hours after administration of the drug. The blood of nearly all of these animals was examined from time to time for periods extending to two or three months, and in only two of them were there any signs of persistence or recurrence of parasitic invasion.

As the drug is colourless, it has an advantage over trypanblue in that it does not stain the mucous membranes and other tissues after injection. This characteristic is not of such consequence in India as it might be in countries like England, where the prolonged staining caused by trypanblue is considered very objectionable. The intramine

preparation, however, did not seem to exercise any tonic or restorative effect, in the manner already indicated in describing the properties of trypanblue. Perhaps this defect need not be looked upon as a grave deterrent towards the use of the drug in countries like England, where, after specific destruction of the piroplasms, treatment can be readily continued by the administration of a course of so-called tonic medicines. In India, however, the conditions of treatment differ greatly, for a skilled veterinarian has official charge of a large tract of country and finds it generally impossible to keep individual animals under prolonged observation. The dithio-aniline preparation again seemed to exert no appreciable inhibitory effect upon trypanosomes.

Action upon Foot-and-Mouth Disease. The following is a brief summary of experiments carried out to determine the efficacy of the drug in the treatment of this disease.

Experiment No. 1. Three calves were used, two of which were injected intravenously with 30 c.c. of a solution of intramine, in a one-third dilution of the usual one per cent. strength, while the third was allowed to remain untreated as a control. All three calves were then artificially infected, by feeding them on grass heavily contaminated with saliva and discharges from the foot lesions of animals naturally affected with the disease; in addition, the gums were scarified and infective saliva applied to them. The two calves that were injected in the meantime with intramine showed very considerable resistance to infection: one calf remained normal in appearance throughout the period of observation, while the other calf showed on the eighth day a rise in temperature (103.6°F. and 103.8°F.), which, however, subsided to normal on the following day, and no outwardly visible symptoms developed. The control calf showed a rise in temperature amounting to 104.6°F. on the eighth day, and shortly afterwards on the same day there appeared on the upper lips and gums erythematous spots, some of which developed into ulcers by the 11th day and were considered to be sufficiently characteristic of typical foot-and-mouth disease lesions.

Experiment No. 2. This experiment was carried out on a herd of 45 bullocks, cows and calves belonging to the Nagpur Jail. On 26th April, foot-and-mouth disease appeared in this herd, and on the following day six bullocks were injected intravenously with 30 c.c. of the one per cent. intramine solution. On April 28th, that is, 48 hours after the first appearance of the disease in the herd, one of these bullocks developed a foot lesion, with a rise of temperature of 104°F. On May 3rd, the remaining five bullocks were given a second injection; on the same day, two fresh calves and three bullocks were injected with the drug and introduced into the infected herd. None of these ten treated animals showed subsequently any febrile disturbance or symptoms of foot-and-mouth disease: they were the only animals in the jail herd that escaped clinical affection.

Experiment No. 3. This experiment was undertaken in the field, under the supervision of Mr. R. V. Pillai, G.B.V.C., on a large herd of cattle in which foot-and-mouth disease had already appeared. It was found that the injection of intramine cut short the course of the disease to an even more striking degree than had been observed by Davidson, and in our own experience with the use of trypanblue.

It is believed that it would be worth while for British practitioners to test the preparations upon clinical cases of redwater, especially in view of the advantage they possess in not giving rise to discoloration of the tissues. The author feels sure that Dr. Hodgson would be prepared to put at their disposal any material they required for the purpose.

From the economic standpoint, the employment of intramine has the considerable merit that the actual cost of the drug is relatively negligible. The dithio-aniline compound, intramine, is a bye-product in preparation of other aniline derivatives, and it can be sold now at a price of about one shilling a pound. Three grammes are sufficient to make 300 c.c. of solution for intravenous injection, and the quantity of solution required for an average sized beast is 30 to 40 c.c. The actual cost of the material for one dose therefore amounts to less than one-hundredth of a penny. A. R. S.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

September 1st to 7th—N.V.M.A. Congress at Newcastle-on-Tyne.

Aug. 20th—Meeting of the Editorial Committee, N.V.M.A., 4-30 p.m.

R.C.V.S. Obituary.

Blue, Allan Pollock, Pitt Street, Glasgow. Graduated, Glasgow, 13th April, 1880. Died, 7th August 1928, aged 75 years.

Army Veterinary Classes.

For the Combatant Officers' classes to be held at the Royal Army Veterinary School, Aldershot, in November-December, 1928, and January-February, 1929, 28 vacancies have now been allotted among the various Commands; and for the Non-Commissioned Officers' classses, to be held October-November, 1928, and March-April, 1929, 57 vacancies have been allotted. Further vacancies up to a total of 50 in each class are available on application through the usual channels.

CORRESPONDENCE.

Veterinary Officers' Duties in Uganda.

To the Editor of The Veterinary Record.

Sir,—I refer to the "Appointment" paragraph in issue No. 21, Vol. VIII. of the Veterinary Record, dated May 26th, 1928.

I feel it is indicated to state that all Veterinary Officers of this Department undertake research in the field as part of their normal duties.

The foregoing should not be construed as detracting from the meritorious service of the Officer named.—Yours faithfully, W. F. Poulton, *Director of Veterinary Services.*

P.O. Box 141,
Kampala, Uganda.
July 17th, 1928.

The Editor acknowledges the receipt of the following:—Communications from the Hon. Secretary Western Counties Division; the Hon. Secretary Royal Counties Division; Hon. Secretary Yorkshire Division; Mr. W. Philipson Moss and Major H. Allen.

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